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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/751,027	12/31/2003	Min Jeong Kim	060943-0055	3680
24341	7590	07/29/2005	EXAMINER	
MORGAN, LEWIS & BOCKIUS, LLP. 2 PALO ALTO SQUARE 3000 EL CAMINO REAL PALO ALTO, CA 94306			MCMAHON, MARGUERITE J	
			ART UNIT	PAPER NUMBER
			3747	

DATE MAILED: 07/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>
	10/751,027	KIM, MIN JEONG
Examiner	Art Unit	
Marguerite J. McMahon	3747	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

1)  Responsive to communication(s) filed on \_\_\_\_.

2a)  This action is **FINAL**.                    2b)  This action is non-final.

3)  Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## **Disposition of Claims**

4)  Claim(s) 1,2,4,6 and 7 is/are pending in the application.

4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

5)  Claim(s) \_\_\_\_\_ is/are allowed.

6)  Claim(s) 1,2,4,6 and 7 is/are rejected.

7)  Claim(s) \_\_\_\_\_ is/are objected to.

8)  Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

9)  The specification is objected to by the Examiner.

10)  The drawing(s) filed on \_\_\_\_\_ is/are: a)  accepted or b)  objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)  The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)  Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a)  All b)  Some \* c)  None of:  
1.  Certified copies of the priority documents have been received.  
2.  Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3.  Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1)  Notice of References Cited (PTO-892)  
2)  Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3)  Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/VMail Date

4)  Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_ .

5)  Notice of Informal Patent Application (PTO-152)

6)  Other: \_\_\_\_\_

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2, and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gover, Jr. et al (4,115,518) in view of Squinto et al (3,508,531). Note a piston capable of reducing friction, comprising a piston head defining at least two recesses 18 for receiving expanding gas, which is formed in a circumferential section of a top land part of the piston head, said recesses being configured such that a part of the expanding gas is introduced into the said recesses during a power stroke of an internal combustion engine, wherein said recesses are deepest at an intermediate portion of the said recesses, and the depth of the said recesses becomes shallower towards the ends of the said recesses, wherein said recesses extend along the circumference of the piston and have ends 38 that are the circumferential ends having angled end walls, which slant upwardly as they extend outwardly, wherein said recess is formed over at least substantially 1/4 of a circumferential section in an entire circumference of the top land part of the piston head (see column 1, lines 30-35 and Figure 1). Note that the Glover, Jr. et al reference is more focused on dispersing thermal concentration than on receiving expanding gas and relieving friction, but it is inherent that the same action and effect of receiving the expanding gases and relieving friction during the power

stroke of the piston would take place in the process of dispersing thermal concentration through the recesses.

Glover, Jr. et al show everything except the recesses being recesses are diametrically opposed to each other. The recesses of Glover, Jr. et al are located adjacent valve pockets 14. Squinto et al teaches that it is old in the art to locate the valve pockets diametrically opposed to each other. It would have been obvious to one having ordinary skill in the art to modify Glover, Jr. et al by providing valve pockets and associated circumferential recesses, which are diametrically opposed to each other. Although Squinto et al show four such valve pockets, it would be within the purview of one of ordinary skill in the art to provide only two, since it is conventional in the engine art to provide two valves, one for intake and one for exhaust. Note also that such valves are commonly diametrically opposed to each other.

***Claim Rejections - 35 USC § 102***

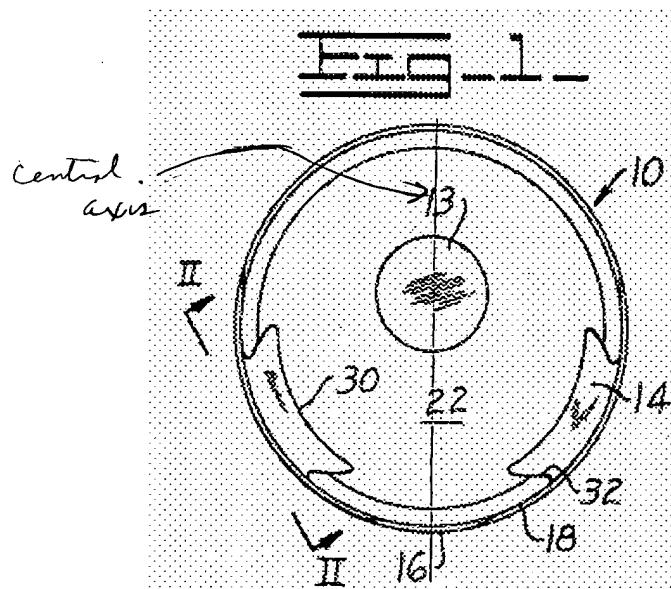
The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 6 and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Glover, Jr. et al (4,114,518). Note a piston structure for reducing frictional losses in an internal combustion engine, comprising a piston head having a top land portion wherein first and second recesses 18 are symmetrically formed in said top land portion on opposite sides of said piston head, said recesses being formed by a vertical cut-away of

a portion of said top land portion, wherein each said cut-away comprises approximately 1/4 of the top land portion in a circumferential direction. See Figure 1 below, which shows how the recesses are formed symmetrically about a central axis that cuts across the top of the piston head.



#### ***Response to Arguments***

Applicant's arguments with respect to claims 1, 2, 4, 6, and 7 have been considered but are moot in view of the new ground(s) of rejection.

#### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marguerite J. McMahon whose telephone number is 703-308-1956. The examiner can normally be reached on flex.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Yuen Henry can be reached on 703-308-1946. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

*mm*  
**MARGUERITE MCMAHON**  
**PRIMARY EXAMINER**